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ABSTRACT

Information on the 1979 employment activities of 1977 graduates with bachelor's and master's degrees in science and engineering (S/E) fields is presented. Trends in cohort size are analyzed to provide a historical perspective for the survey findings. Factors causing employment levels to be lower than the cohort size as S/E graduates made the transition from school to work are summarized, and the employment patterns of S/E graduates who are employed in S/E jobs and the implications of these patterns are examined. Among the findings are the following: employment in S/E jobs was obtained by about one-half of the bachelor's degree-holders and about three-fourths of the master's degree-holders; employment in part-time and non-S/E jobs occurs among only about one-sixth of the degree-holders in the labor force; while about 9 out of 10 of the engineering and computer science graduates were working in S/E jobs, only about 1 in 5 of the social science degree-holders were so employed; employment opportunities for recent S/E graduates have shifted toward jobs in industry and with the federal government; in general, the S/E utilization rates for men were higher than those for women at both the bachelor's and master's level; most of the differences in utilization rates can be attributed to concentrations of men or women in particular fields (men predominate in engineering and women in the social sciences); R&D activities continue to be the primary work of about one-third of scientists and engineers with recently acquired bachelor's and master's degrees. Salary information is also analyzed. (SW)

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employment attributes of recent science and engineering graduates

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foreword

This report presents findings on the employment patterns of recent science and engineering (S/E) graduates who gained employment in S/E jobs. These employment patterns provide early and dramatic indicators of labor market changes for scientists and engineers. The extent to which young S/E graduates seek and are able to find employment provides a measure of the robustness of the economy; the degree to which they are employed in S/E jobs and the attributes of that employment generally reflect the level of activity of the Nation's scientific and technological enterprise. This type of information can be of value to science policymakers, potential employers of scientists and engineers, and students and educational counselors.

Two earlier reports on recent S/E graduates have been issued. The first investigated the extent to which S/E graduates entered the labor force and found employment, and the relationship of that employment to the field of study. The second report investigated the effects of the acquisition of skill over time and of changes in the economic environment on labor market performance.

Information contained in this report is based on a 1979 survey of bachelor's- and master's-degree recipients in S/E fields. Surveys in this series provide one of the major data bases used by the National Science Foundation (NSF) to estimate the characteristics and activities of the total U.S. S/E population.

Charles E. Falk
Director, Division of Science
Resources Studies
National Science Foundation

October 1980

acknowledgments

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related publications

Reviews of Data on Science Resources

No. 36. "Employment Characteristics of Recent Science and Engineering Graduates: The Effects of Work Experience, Advanced Degrees, and Business Cycles"	80-311	$1.50
No. 32. "Employment Patterns of Recent Entrants into Science and Engineering"	78-310	$0.80

Reports

Science and Engineering Personnel: A National Overview	80-316	$4.25
National Patterns of Science and Technology Resources, 1980	80-308	$3.75

Availability of Publications

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(See inside back cover for Other Science Resources Publications.)

highlights

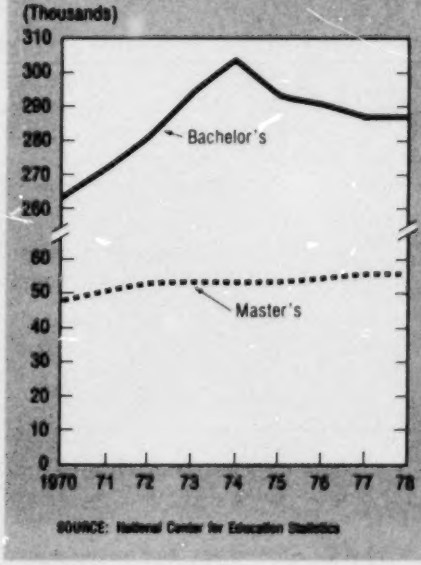
- The S/E utilization rate, i.e., the proportion of 1977 S/E graduates in the labor force employed in S/E jobs in 1979, indicates a limited potential for S/E employment among recent graduates at the bachelor's- and master's-degree levels. Employment in S/E jobs was obtained by about one-half of the bachelor's degree-holders and about three-fourths of the master's degree-holders. Between 1978 and 1979, the S/E utilization rate showed a modest increase at both degree levels.
- The observed low S/E utilization rates are not necessarily indicators of underemployment since underemployment in the form of involuntary employment in part-time and non-S/E jobs occurs among only about one-sixth of the recent S/E baccalaureate and master's degree-holders in the labor force.
- The S/E utilization rate of the recent S/E degree recipients varied substantially by field of degree. While about 9 out of 10 of the engineering and computer science graduates were working in S/E jobs, only about 1 in 5 of the social science degree-holders were so employed.
- There was an excess demand for computer scientists, approximate supply/demand balance in chemistry and engineering, and an excess supply in other scientific fields. This excess supply in most fields was observed at both the bachelor's- and master's-degree levels. The imbalances, however, were smaller for recent master's-degree recipients.
- Employment opportunities for recent S/E graduates have shifted toward jobs in industry and with the Federal Government. Between 1976 and 1979, the increases in the number of recent S/E graduates hired in these two sectors were 20 percent and 15 percent, respectively. Other sectors showed absolute declines. The growth in industrial employment correlates with recovery from the 1974–75 economic recession while the increase in Federal employment appears related to the increased emphasis on environmental and energy programs, areas where S/E skills are sought.
- In general, the S/E utilization rates for men were higher than those for women at both the bachelor's- and master's-degree level. Much of the difference in utilization rates can be attributed to concentrations of men or women in particular fields. Men predominate in engineering and women are concentrated in the social sciences. When these field effects are taken into consideration, the S/E utilization rates actually invert in favor of women at the bachelor's-degree level and the differential narrows from 21 per 100 to 8 per 100 for master's degree-holders.
- R&D activities continue to be the primary work of about one-third of scientists and engineers with recently acquired bachelor's and master's degrees. This level of involvement, however, is substantially lower than that of Ph.D.'s where almost one-half are primarily engaged in R&D activities.
- Recent S/E graduates in S/E jobs enjoyed higher salaries than their peers in non-S/E jobs. Average earnings of the S/E-employed group were about one-third higher. Bachelor's degree-holders in engineering and the life and social sciences, however, reported comparable salaries for S/E and non-S/E employment.

introduction

This study focuses on the 1979 employment activities of a subset of recent graduates with bachelor's and master's degrees in science and engineering (S/E) fields—the 1977 graduating cohorts. A brief analysis of trends in cohort size is first offered to provide historical perspective for current findings. Then follows a summary of the factors causing employment levels to be lower than the cohort size as S/E graduates make the transition from school to work. The remainder of this report examines the employment patterns of S/E graduates who are employed in S/E jobs and the implications of these patterns. The report concentrates on involvement in science and engineering because it is a good index of the demand for these graduates within the Nation's scientific and technical enterprise.

There have been divergent trends, betweem 1974 and 1978, in the number of degree recipients in S/E fields.[1] At the bachelor's-degree level, the number declined; at the master's-degree level the number increased slightly (chart 1). These divergent trends reflect a combination of demographic effects and other factors such as the perceived attractiveness of S/E careers.

Chart 1. Science/engineering bachelor's and master's degrees awarded by U.S. institutions: 1970-78



[1] Department of Health, Education, and Welfare, National Center for Education Statistics, *Earned Degrees Conferred*, annual series.

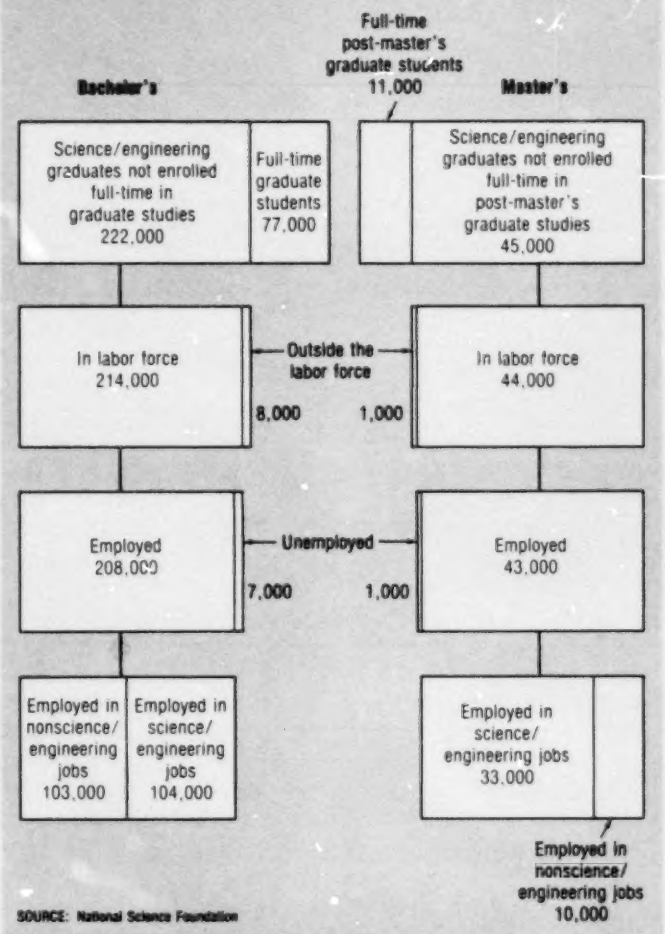
When the 1977 graduating cohorts were surveyed in 1979, not all were employed and only part were employed in S/E jobs (chart 2). Some stayed in school full time for further training; others (about 3 percent) opted to remain outside of the labor force; i.e., choosing neither to work nor to seek work. An equally small number were unemployed (i.e., they were not employed, but sought work); and a substantial number were working in non-S/E jobs (about one-half of the employed S/E bachelor's-degree recipients and about one-quarter of the employed S/E master's-degree recipients).

The movement of 1977 graduates to S/E jobs amounted to about 104,000 baccalaureate recipients and 33,000 master's degree-holders. These employment levels represented a modest absolute gain since 1976 for baccalaureate recipients (up from 99,000) but no significant increase for master's degree-holders. The observed movement away from S/E employment does not necessarily indicate underutilization of these highly trained people. Much of the leakage described above (i.e., full-time enrollment in graduate school, decisions to remain outside the labor force, and decisions to work in non-S/E jobs) can be attributed to voluntary actions. For example, decisions to remain in school represent voluntary decisions to forego current income and to incur some costs to derive future benefits in the form of enhanced career opportunities.

An aspect of underutilization in 1979, however, can be inferred from the number who were unemployed or involuntarily employed part time or in non-S/E jobs. The 1979 unemployment rate for these cohorts ranged around 2 and 3 percent, down from the 4 to 8 percent levels that prevailed in 1976 reflecting improved economic conditions during the later period. While these cohorts fared well in terms of unemployment, there appeared to be a significant amount of involuntary employment—in part-time and non-S/E jobs—particularly for recent S/E graduates with a bachelor's degree. Involuntary part-time employment rates were about 2 percent for master's- and bachelor's-degree recipients in the labor force. The analogous rates of involuntary non-S/E employment (full time) were 9 percent and 2 percent for bachelor's and master's degree-holders, respectively.

Thus, the data indicate that almost all of those who sought jobs found them, but many of these jobs were in non-S/E occupations. Since employment in S/E jobs provides the clearest indication of demand for these graduates in scientific and technological activity, the remainder of this analysis focuses on the subset of recent graduates who reported that they were so employed.

Chart 2. Transition of 1977 science/engineering bachelor's- and master's-degree recipients from school to work: 1979



employment in S/E jobs

The "S/E utilization rate"—the number of recent S/E graduates employed in S/E jobs per 100 recent S/E graduates in the labor force[2]—is an indication of relative demand. These rates were substantially below the full utilization of S/E graduates in S/E jobs in 1979 (chart 3). About one-half of the relevant 1977 S/E bachelor's-degree recipients and about three-quarters of the corresponding master's-degree recipients were employed in S/E jobs.

The S/E utilization rates varied by field as well as by level of degree. Examination of recent trends (1976–79) in these rates shows an increased demand for life science degree-holders at the bachelor's level, and for physical science degree-holders at the master's level. Engineering degree-holders showed increasing demand at both degree levels (chart 4).

The field variability in the 1979 S/E utilization rates of baccalaureate recipients reflects the supply/demand balance of the S/E labor market for individuals at this degree level. In general, the data indicate a relatively greater demand for individuals with degrees in engineering than for science-degree recipients and, within the scientific specialties, a greater demand for computer specialists.[3]

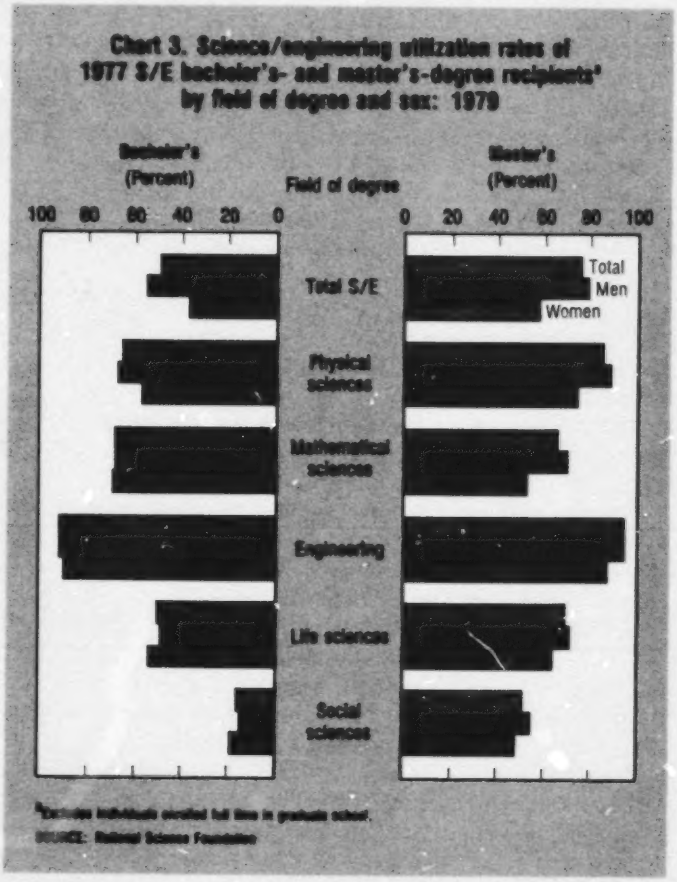


Chart 3. Science/engineering utilization rates of 1977 S/E bachelor's- and master's-degree recipients[1] by field of degree and sex: 1979

[1] Excludes individuals enrolled full time in graduate school.
SOURCE: National Science Foundation

While more than 9 out of 10 of the engineering and computer science graduates in the labor force were working in S/E jobs, less than 1 in 5 of the social science degree-holders were so employed. Similar findings are noted for recent S/E graduates with master's degrees, with a smaller difference in utilization rates between engineers and social scientists (9 out of 10 versus 1 out of 2). These data are consistent with the recognized fact that, in many fields, the baccalaureate does not accord professional standing in S/E occupations.

[2] Throughout the remainder of this report, the analysis of labor market performance involves only those who were not full-time graduate students at the time of the survey.

[3] Data for detailed fields are included in table A.

Utilization rates for recent S/E master's-degree recipients in the mathematical sciences (which include computer sciences) and engineering were comparable to those of bachelor's degree-holders. Rates were considerably higher, however, among master's degree-holders in the physical, life, and social sciences, especially among the latter fields.

In general, men reported higher utilization rates than women, given field and level of degree. The S/E utilization rate of male baccalaureate-holders across all fields was 55 percent as compared with 37 percent for women. Among master's-degree recipients the rates for men and women were 79 percent and 58 percent, respectively. These differentials are largely the result of concentrations of men or women in certain S/E fields. Men predominate in engineering whereas women are concentrated in the social sciences.

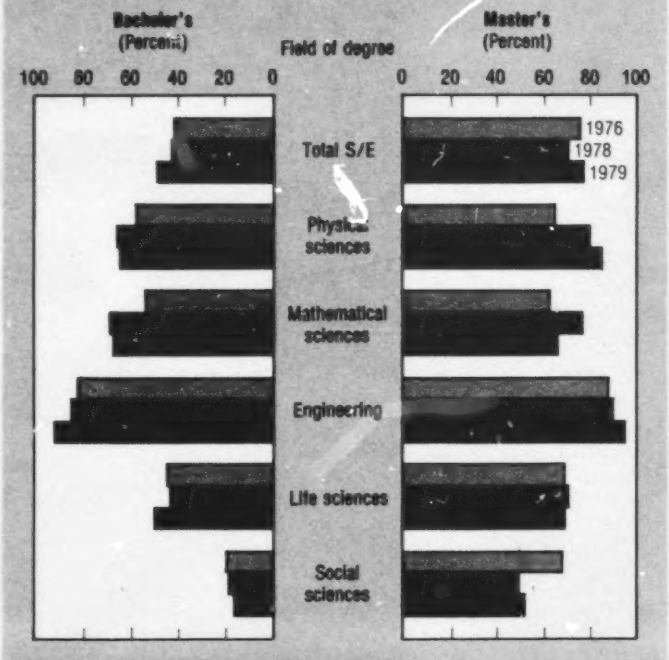
When the sex differences in field distribution are accounted for, as summarized below, the differences in S/E utilization rates invert in favor of women for bachelor's degree-holders and narrow from 21 per 100 to 8 per 100 for master's degree-holders. The remaining unexplained difference may reflect employer hiring preferences in S/E jobs.[4]

Effects of sex differences in field distribution on S/E utilization rates

	Bachelor's		Master's	
	Male	Female	Male	Female
	(Percent)			
Actual S/E utilization rate	55	37	79	58
Modified [1] S/E utilization rate	[1]34	37	[1]66	58

[1] Derived by giving men the field characteristics of women and then computing the average utilization rate from the male field-specific rates.

Chart 4. Science/engineering utilization rates of recent S/E bachelor's- and master's-degree recipients: 2 years following graduation



[a] Excludes individuals enrolled full time in graduate school.
SOURCE: National Science Foundation

[4] The effects of the greater relative supplies of recent female graduates are more difficult to assess but can be estimated. If, other things being the same, the number of female graduates had not grown relative to male graduates since 1970, the estimated S/E utilization rates for females would have been 45 per 100 and 75 per 100 for bachelor's and master's degrees, respectively. Thus, the greater relative supply is estimated to have contributed 44 percent and 90 percent of the observed differentials at the bachelor's- and master's-degree levels, respectively.

employment in field of degree

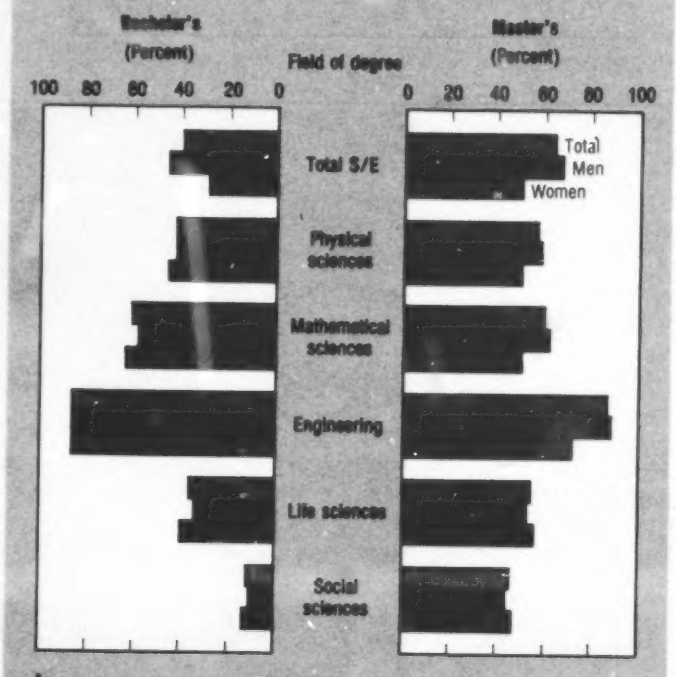
Data regarding the extent to which 1977 S/E graduates were employed within their field of degree in 1979 are presented in chart 5.[5] Except for engineering and the mathematical sciences, less than one-half of the baccalaureate recipients in S/E fields were employed within their field of study. As before, the field employment rate in computer sciences, a subfield of the mathematical sciences, was about as large as the analogous rate for engineers. About 6 out of 7 bachelor's-degree recipients in engineering and computer sciences were employed within their degree fields. The employment rates in other degree fields were substantially lower, especially among social science degree-holders of whom about 1 in 10 were working in social science occupations.

The proportion of women employed in the field of their degree was lower than that of men; i.e., 29 percent as compared with 46 percent among male baccalaureate recipients. Once again, however, this sizable overall differential appears to be the result of different field patterns of men and women, since the rates for women baccalaureates are equal to, or exceed, those of men in each of the broad fields examined (chart 5).

The overall field employment rates of master's-degree recipients were significantly higher, both for men and women. Among men, as before, this higher rate was especially evident in all fields but mathematical scienceshand engineering, where field employment rates of master's were no higher than those of bachelor's degree-holders.

A similar pattern emerges with respect to women except that field employment rates in the matematical sciences and in engineering were lower than at the baccalaureate level.

Chart 5. Percent of employed 1977 S/E bachelor's- and master's-degree recipients[a] working in field of degree by sex: 1979



[a] Excludes those enrolled full time in graduate school.

SOURCE: National Science Foundation

[5] For purposes of this study, an individual whose degree and employment fall within the same broad field category is considered to be working in his or her field.

Because of the relatively large sampling errors associated with the employment characteristics of women at the master's level, these differences must be interpreted with caution. Nevertheless, the data indicate that the acquisition of a master's degree in these fields by women results in a greater level of field switching than was the case at the baccalaureate level.

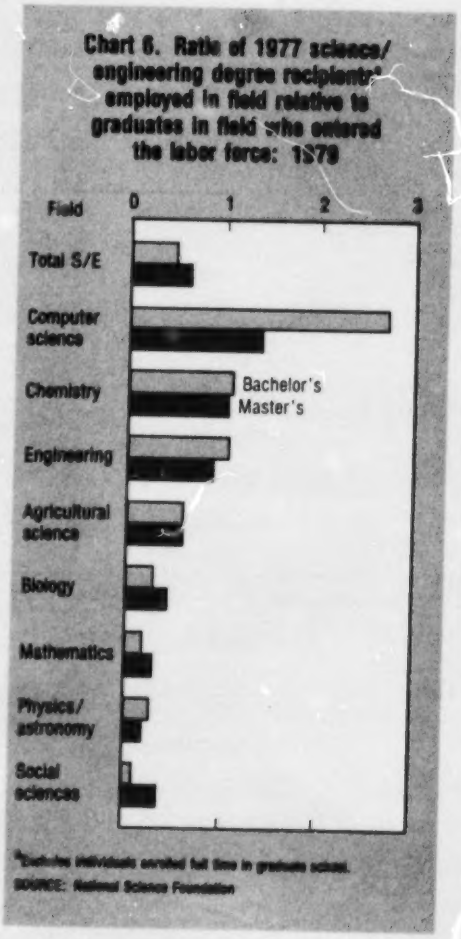
This anomaly may be related to the change in the pattern of employment affiliation of women upon attainment of the master's degree in these fields. For example, among mathematical science degree-holders at the baccalaureate level, about two-thirds of both men and women were employed by business and industry. At the master's-degree level about 48 percent of men were industrially employed while the corresponding rate for women mathematicians was only 35 percent. At the same time, academic employment rates for men and women (in all educational institutions) holding the master's degree were 20 percent and 50 percent, respectively. Thus, the data suggest that women holding the master's degree in the mathematical sciences continue to be oriented to the teaching occupations.

adequacy of recent S/E degree production

The adequacy of recent S/E degree production in terms of employment demand can be indexed by the ratio of employment (classified by field of employment) to labor force (classified by field of degree.) A ratio of less than one indicates a relative excess supply of recent graduates in that field; a ratio greater than one indicates a relative excess demand.

Based on this index, one can conclude that supply exceeds demand in most fields at both the bachelor's- and the master's-degree levels, although in 1979 relative imbalances were somewhat smaller at the master's-degree level (chart 6). The index shows conditions of substantial excess supply in the life and social sciences, approximate supply-demand balance for chemistry and engineering, and excess demand for computer scientists.

Since the transition of recent S/E degree recipients from school to work entails a shift from degree field to employment field, the latter classification will be used in the remaining sections of this report unless otherwise noted.



sector of employment

Employment data for recent graduates for the years 1976 and 1979 reveal an annual growth rate of less than 2 percent per year for S/E jobs and a relative shift of employment opportunities to jobs in industry and the Federal Government (chart 7). These findings hold at both the bachelor's- and master's-degree levels. Overall employment in S/E activities grew by 5.5 percent for recent S/E bachelor's-degree recipients and 2.8 percent for master's-degree recipients between 1976 and 1979. This modest overall growth in employment, however, consisted of increases in excess of 20 percent for business and industry and 15 percent for the Federal Government, and absolute employment declines in the other sectors combined. The academic sector showed no growth during the period; a small increase in employment for recent S/E bachelor's-degree recipients was more than offset by a decline in employment for S/E master's recipients.

The differentials in growth rates observed between 1976 and 1979 can partially be explained by the recovery from the 1974–75 recession (which contributes to the strong employment trend observed in business and industry.) The uncertain financial situation in academia—brought about largely by expected declines in enrollments—may explain the leveling off of employment in academia. At the same time, the growth of employment in the Federal Government may reflect increased emphasis on environmental and energy issues, areas where S/E skills are essential.

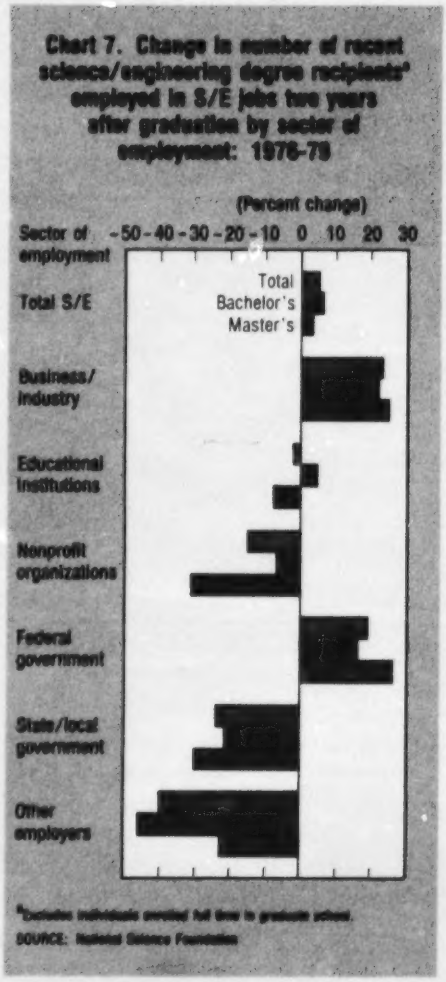


Chart 7. Change in number of recent science/engineering degree recipients* employed in S/E jobs two years after graduation by sector of employment: 1976-79
(Percent change)
Sector of employment
-50 -40 -30 -20 -10 0 10 20 30
Total S/E
Total
Bachelor's
Master's
Business/ industry
Educational institutions
Nonprofit organizations
Federal government
State/local government
Other employers
*Excludes individuals enrolled full time in graduate school.
SOURCE: National Science Foundation

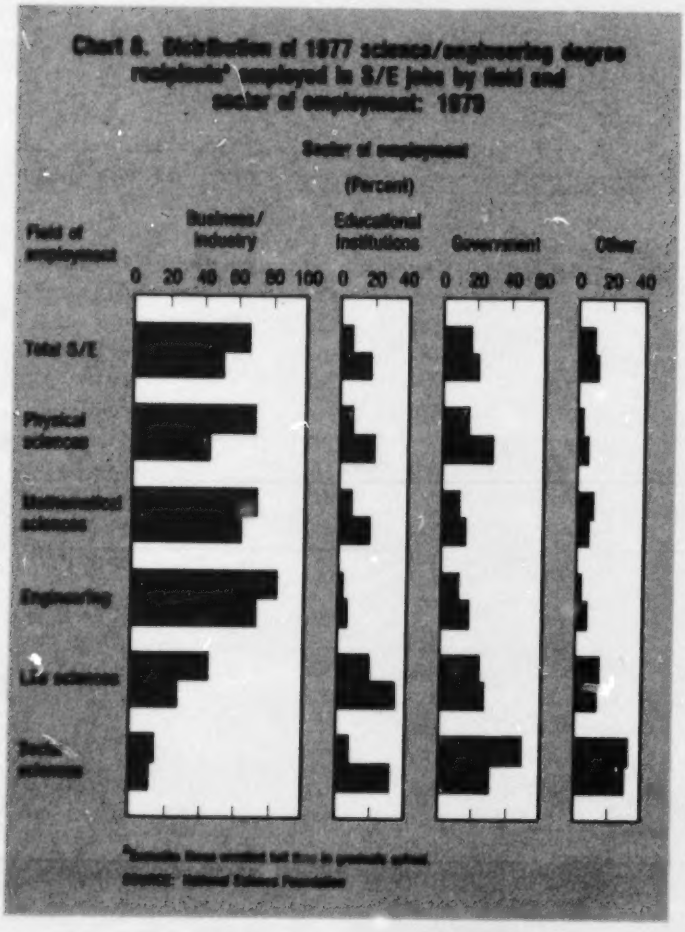
Thus, business and industry remains the principal sector of employment for recent S/E graduates in 1979, especially for bachelor's-degree recipients (chart 8). This finding is not surprising, considering the following: (1) 86 percent of all economic activity took place in the private sector in 1979[6] and (2) 62 percent of all scientists and engineers (both experienced and recent graduates) were employed in business and industry in 1978.[7]

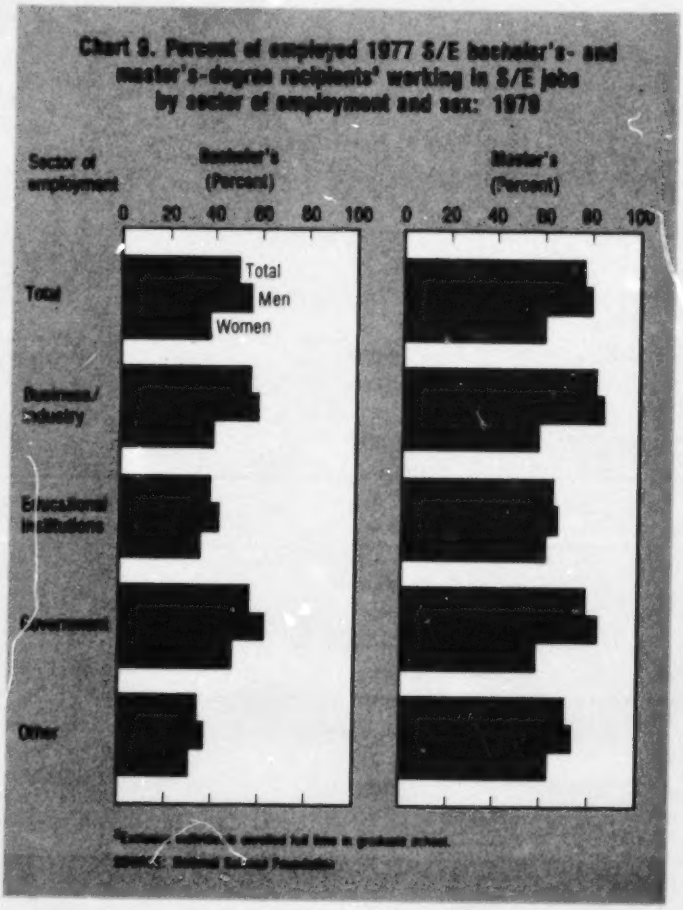
[6] Based on the gross national product. Council of Economic Advisers. *Economic Report of the President.* (Washington, D.C.: Supt. of Documents, U.S. Government Printing Office, 1980.)

[7] National Science Foundation, *U.S. Scientists and Engineers, 1978* (Detailed Statistical Tables) (NSF 80-304) (Washington, D.C., 1980.)

The differences by degree level in sectoral employment distributions may be the result of differences in field distribution by degree level. The numbers of recent S/E graduates at the bachelor's-degree level working in S/E jobs are greatest in the fields of engineering, computer science (included with the mathematical sciences), and chemistry (included with the physical sciences). These fields have traditionally enjoyed relatively strong employment affiliations with the private sector (chart 8).

Examination of S/E employment rates by sector shows that business and industry and the Federal Government employed a larger share of recent S/E graduate hires in S/E jobs than did other sectors of the economy, regardless of sex or level of degree (chart 9). Within sectors, this employment share was larger for master's-degree recipients than for bachelor's degree-holders and was larger for men than for women. The degree-level differential is in part attributable to the fact that the master's degree is a prerequisite for S/E work in many fields. The sex differential is due in part to the sex distribution within fields.

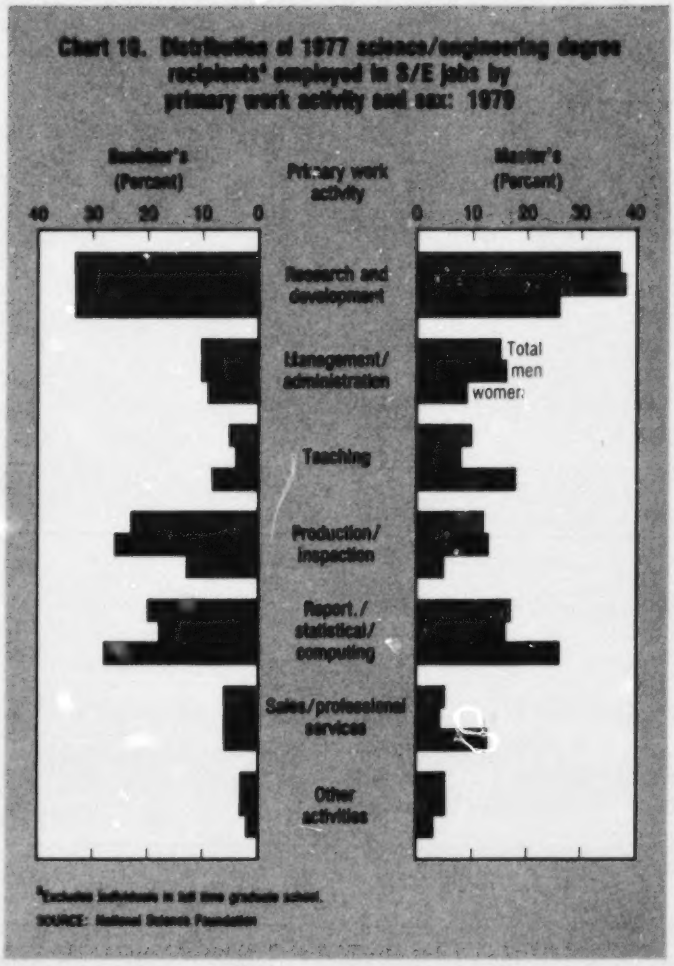




primary work activity

Research and development continues to be the dominant work activity for recent graduates in S/E jobs[8] (chart 10). Over one-third of the recent graduates were primarily engaged in R&D activities in 1979. This degree of R&D involvement is notably lower than comparable involvement by Ph.D.'s in S/E jobs; almost one-half of these Ph.D.'s reported some R&D activity as their primary work in 1979.[9] Involvement in research and development varied among recent S/E graduates by level of S/E degree and sex. Among recent graduates with master's degrees, men were more likely to be involved in R&D activities as their primary work. Women tended to be concentrated in the social and mathematical science fields where teaching and report generating or computational work are the primary activities.

The degree effect may be due to differences in distributions by field and employment sector or to the relative complexity of R&D work. There were disproportionate numbers of engineers and computer specialists at the bachelor's-degree level. Graduates employed in these fields were more likely to be primarily engaged in production-related activities (e.g. engineers) or in report generating or computational activities (e.g., computer specialists). Similarly, bachelor's-degree recipients were more likely to be employed in the industrial sector, where R&D activity is less often the primary work than in the academic sector. Finally, the relative complexity of R&D activity may cause employers to prefer using recent graduates with advanced degrees in these types of activity.



[8] More detailed direct comparisons with earlier periods are not possible because of changes that have been made in the primary work activity taxonomy.

[9] National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States, 1981* (Detailed Statistical Tables) (NSF 80-323) (Washington, D.C., 1981.)

salaries

Recent S/E graduates employed in S/E jobs generally enjoyed higher salaries than comparable graduates in non-S/E jobs (chart 11). The exceptions were the fields of engineering, life sciences, and social sciences at the bachelor's-degree level. On average, those employed in S/E jobs earned about one-third more than those in non-S/E jobs.

The differentials between S/E and non-S/E salaries were not substantial among degree-holders in engineering and the life and social sciences, especially at the baccalaureate level. The salary premium for S/E employment was most evident among mathematical science degree-holders.

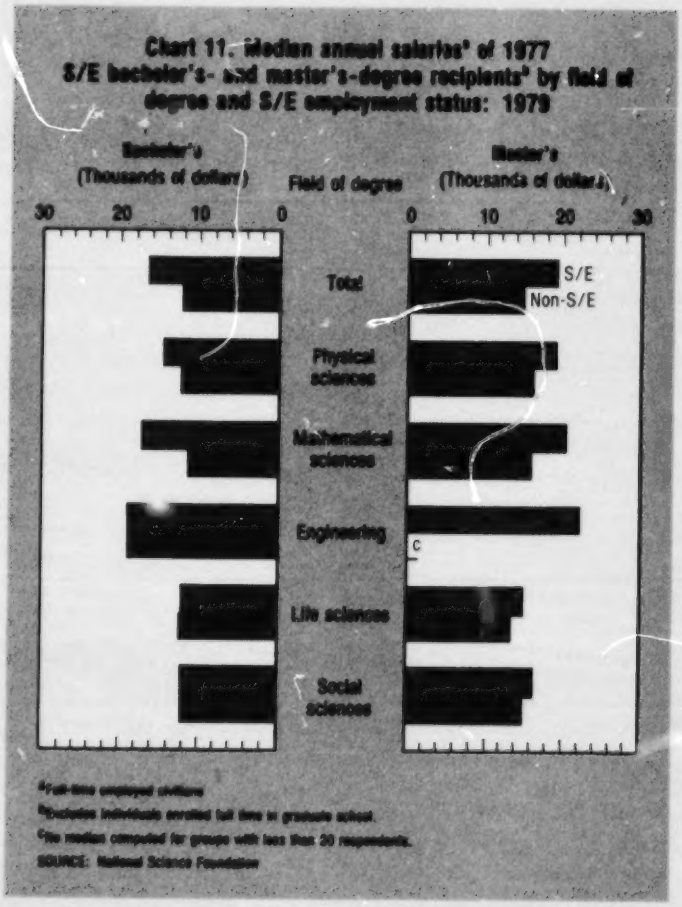


Chart 11. Median annual salaries[a] of 1977 S/E bachelor's- and master's-degree recipients[b] by field of degree and S/E employment status: 1979

[a] Full-time employed civilians

[b] Excludes individuals enrolled full time in graduate school.

[c] No median computed for groups with less than 20 respondents.

SOURCE: National Science Foundation

appendix

detailed statistical tables

appendix

detailed statistical tables

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B. Selected employment characteristics of 1977 master's-degree recipients in science and engineering by field and sex: 1979. 16

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F. Median annual salaries of 1977 science/engineering master's-degree recipients by field of study and S/E emloyment status: 1979 19

Table A. Selected employment characteristics of 1977 bachelor's-degree recipients[1] in science and engineering by field and sex: 1979

Field of study	Total			Labor force			Total employed			Employed in science engineering			Employed in field		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total	222,200	145,500	76,700	214,500	144,500	70,100	207,500	140,700	66,900	104,500	78,900	25,700	84,000	64,500	19,500
Physical sciences	16,200	12,400	3,800	15,600	12,200	3,400	15,100	11,900	3,200	10,100	8,200	2,000	6,500	5,100	1,500
Chemistry	5,600	4,200	1,400	5,400	4,100	1,300	5,300	4,100	1,200	4,000	3,100	900	3,200	2,400	800
Physics/ astronomy	1,800	1,500	300	1,800	1,500	300	1,700	1,400	300	1,300	1,100	200	400	300	(2)
Environmental science	7,800	5,900	1,900	7,500	5,900	1,600	7,200	5,700	1,500	4,300	3,500	800	2,800	2,200	600
Other physical sciences	1,000	700	300	1,000	700	300	900	700	200	500	400	100	200	100	(2)
Mathematical sciences	18,000	11,100	6,900	17,900	11,100	6,800	17,800	11,000	6,800	12,200	7,500	4,700	10,800	6,500	4,300
Mathematics	12,300	6,800	5,500	12,100	6,800	5,300	12,000	6,700	5,300	7,000	3,700	3,300	5,900	3,000	3,000
Computer sciences	5,800	4,300	1,500	5,800	4,300	1,500	5,800	4,300	1,500	5,100	3,800	1,400	4,900	3,500	1,400
Engineering	45,800	43,600	2,200	45,700	43,400	2,200	45,100	43,000	2,100	41,900	40,000	2,000	39,500	37,600	1,900
Life sciences	52,300	33,000	19,300	50,800	32,800	18,000	49,200	31,900	17,300	25,600	16,100	9,500	18,200	11,300	6,900
Biology	34,700	19,500	15,200	33,600	19,300	14,300	32,300	18,600	13,700	14,800	7,400	7,400	8,900	4,000	4,900
Agricultural sciences	17,600	13,500	4,100	17,200	13,500	3,700	16,900	13,300	3,600	10,800	8,700	2,100	9,300	7,300	2,000
Social sciences	89,800	45,400	44,400	84,600	45,000	39,600	80,400	42,900	37,500	14,700	7,200	7,500	9,000	4,100	4,900
Psychology	36,300	15,000	21,200	32,800	15,000	17,800	31,000	14,500	16,500	6,500	2,700	3,800	4,000	1,600	2,400
Economics	10,900	8,600	2,300	10,600	8,600	2,000	9,900	8,100	1,900	2,500	1,800	700	1,500	700	700
Sociology/ anthropology	25,700	10,100	15,600	24,700	9,800	14,900	23,400	9,100	14,300	3,800	1,600	2,200	2,200	900	1,300
Other social sciences	17,000	11,700	5,300	16,500	11,500	4,900	16,100	11,300	4,800	7,900	1,100	800	1,300	900	400

[1] Excludes those enrolled full-time in graduate school.
[2] Less than 50.

NOTE: Detail may not add to totals because of rounding. Statistics generated from these data may be slightly different from those presented in the text since the latter were based on absolute numbers.
SOURCE: National Science Foundation.

Table B. Selected employment characteristics of 1977 master's-degree recipients[1] in science and engineering by field and sex: 1979

Field of study	Total			Labor force			Total employed			Employed in science engineering			Employed in field		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total	45,300	35,300	10,000	44,300	35,100	9,200	43,400	34,500	8,800	33,000	27,700	5,300	33,600	27,800	5,800
Physical sciences	4,400	3,500	900	4,200	3,400	800	4,200	3,400	800	3,700	3,100	600	2,400	2,000	400
Chemistry	1,300	900	400	1,200	900	400	1,200	900	300	1,200	800	300	900	700	200
Physics/ astronomy	700	600	100	700	600	100	700	600	100	700	600	100	300	300	(2)
Environmental sciences	2,100	1,700	400	2,000	1,700	300	2,000	1,700	300	1,600	1,400	200	1,100	1,000	100
Other physical sciences	300	300	(2)	300	300	(2)	300	300	(2)	200	200	(2)	100	100	(2)
Mathematical sciences	5,700	4,200	1,500	5,500	4,100	1,300	5,300	4,000	1,300	3,600	2,900	700	3,100	2,500	700
Mathematics	3,000	1,900	1,100	3,000	1,900	1,000	2,800	1,800	1,000	1,700	1,200	500	1,500	1,100	400
Computer sciences	2,600	2,300	400	2,500	2,200	300	2,400	2,200	300	2,000	1,700	300	1,700	1,400	300
Engineering	14,900	14,200	700	14,800	14,100	700	14,700	14,000	700	14,100	13,500	600	12,900	12,400	500
Life sciences	8,100	6,000	2,100	7,900	6,000	1,900	7,700	5,900	1,800	5,500	4,200	1,200	4,100	3,100	1,000
Biology	5,300	3,500	1,800	5,100	3,400	1,700	4,900	3,300	1,600	3,400	2,400	1,100	2,600	1,700	900
Agricultural sciences	2,800	2,600	300	2,800	2,600	200	2,800	2,600	200	2,000	1,800	200	1,500	1,400	100
Social sciences	12,300	7,400	4,900	11,900	7,400	4,500	11,500	7,200	4,200	6,200	4,100	2,200	5,100	3,200	2,000
Psychology	6,400	3,200	3,200	6,200	3,200	3,000	6,000	3,100	2,900	3,500	2,000	1,500	3,300	1,800	1,400
Economics	2,000	1,700	200	2,000	1,700	200	1,900	1,700	200	1,300	1,200	100	1,000	900	100
Sociology/ anthropology	2,000	1,000	1,000	1,800	1,000	900	1,700	900	800	900	500	500	700	300	300
Other social sciences	1,900	1,500	400	1,900	1,500	400	1,900	1,500	400	600	600	100	300	200	100

[1] Excludes those enrolled full time in graduate school.

[2] Less than 50.

NOTE: Detail may not add to totals because of rounding. Statistics generated from these data may be slightly different from those presented in the text since the latter were based on absolute numbers.

SOURCE: National Science Foundation.

Table C. Distribution of 1977 science/engineering bachelors'-degree recipients[1] employed in S/E jobs by field, sector of employment, and primary work activity: 1979

Field of employment	Total number employed	Sector of employment						Primary work activity						
		Bus./ ind.	Educ. instits.	Non-profit orgs.	Fed. Govt.	State/ local govts.	Other	R&D	Mgt./ admin.	Teaching	Prod./ inspec.	Rep./ stat./ comp. actvs.	Sales/ prof. servs.	Other
Total	104,500	69,800	7,600	2,900	8,200	9,500	6,600	34,400	10,000	5,600	24,000	21,300	6,300	2,800
Physical sciences	10,500	7,600	800	200	1,000	700	300	4,500	900	700	2,500	1,300	400	200
Mathematical sciences	17,900	13,000	1,300	800	1,000	900	900	3,400	600	400	700	11,800	200	900
Engineering	46,800	39,600	1,100	200	2,800	1,800	1,300	19,000	3,900	1,200	14,200	5,500	1,900	1,000
Life sciences	19,600	8,500	3,800	500	2,500	2,200	2,200	6,100	2,700	700	6,100	1,500	2,100	400
Social sciences	9,700	1,200	600	1,200	900	3,800	1,900	1,400	1,900	2,500	500	1,200	1,800	300

[1] Excluding those enrolled full time in graduate school.
[2] Less than 50 cases.

NOTE: Detail may not add to totals because of rounding.
SOURCE: National Science Foundation.

Table D. Distribution of 1977 science/engineering master's-degree recipients[1] employed in S/E jobs by field, sector of employment, and primary work activity: 1979

Field of employment	Total number employed	Sector of employment						Primary work activity						
		Bus./ ind.	Educ. instits.	Non-profit orgs.	Fed. Govt.	State/ local govts.	Other	R&D	Mgt./ admin.	Teaching	Prod./ inspec.	Rep./ stat./ comp. actvs.	Sales/ prof. servs.	Other
Total	33,000	16,800	5,700	1,100	3,900	3,000	2,700	12,100	4,900	3,300	3,900	5,700	1,700	1,500
Physical sciences	3,600	1,600	700	100	500	500	100	1,700	400	400	500	500	(2)	(2)
Mathematical sciences	4,900	3,000	800	100	600	100	200	1,200	300	500	200	2,500	(2)	100
Engineering	14,600	10,500	800	300	1,400	900	800	6,700	2,600	500	2,500	1,600	(2)	900
Life sciences	4,600	1,200	1,600	100	700	500	400	1,700	1,000	500	500	400	200	200
Social sciences	5,400	500	1,800	500	600	900	1,200	700	600	1,400	200	700	1,600	300

[1] Excluding those enrolled full time in graduate school.
[2] Less than 50 cases.

NOTE: Detail may not add to totals because of rounding.
SOURCE: National Science Foundation.

Table E. Median annual salaries of 1977 science/engineering baccalaureate recipients[1] by field of degree and S/E employment status: 1979

Field of degree	Total employed			Science/engineering employed			Non-science/engineering employed		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total	14,100	15,300	11,500	16,300	17,100	13,200	12,100	13,100	10,500
Physical sciences	14,200	14,300	13,600	14,700	14,700	14,500	12,100	12,200	10,200
Chemistry	14,100	14,200	13,700	14,500	14,500	14,500	11,600	12,100	[2]
Physics/astronomy	15,100	15,100	[2]	15,500	15,400	[2]	[2]	[2]	[2]
Environmental sciences	13,600	14,100	12,100	14,500	14,600	[2]	12,200	12,900	10,200
Other physical sciences	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]	[2]
Mathematical sciences	16,000	16,300	15,100	17,100	17,200	16,500	11,300	12,100	10,700
Mathematics	14,600	[illegible]00	14,400	16,400	16,800	16,200	11,100	11,600	10,700
Computer sciences	18,100	8,600	[2]	18,600	18,900	[2]	[2]	[2]	[2]
Engineering	18,900	18,900	19,200	18,900	18,900	19,300	18,900	18,900	[2]
Life sciences	12,000	12,200	11,200	12,000	12,100	11,100	12,100	12,500	11,600
Biology	11,600	12,100	11,400	11,200	11,400	11,100	12,100	12,200	11,700
Agricultural sciences	12,200	12,800	10,200	12,400	12,900	10,600	12,200	12,600	9,100
Social sciences	12,000	13,000	10,500	12,000	11,300	12,100	12,000	13,300	10,300
Psychology	11,600	12,200	11,100	10,400	10,100	11,100	12,000	13,200	11,000
Economics	15,000	15,300	[2]	[2]	[2]	[2]	14,800	15,100	[2]
Sociology/anthropology	11,000	12,000	10,100	11,200	[2]	[2]	10,800	12,100	10,100
Other social sciences	12,900	13,000	11,200	[2]	[2]	[2]	13,000	13,400	9,400

[1] Excludes individuals enrolled full-time in graduate school.

[2] No median computed for groups with less than 20 respondents.

NOTE: Median annual salaries computed only for full-time employed civilians.

SOURCE: National Science Foundation

Table F. Median annual salaries of 1977 science/engineering masters'- degree recipients[1] by field of study and S/E employment status: 1979

Field of study	Total employed			Science/engineering employed			Non-science/engineering employed		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total	18,900	19,500	14,900	19,400	20,100	15,300	15,000	16,100	14,200
Physical sciences	19,000	19,300	16,200	19,300	19,500	16,800	16,100	16,900	(2)
Chemistry	18,900	19,500	(2)	19,100	19,600	(2)	(2)	(2)	(2)
Physics/ astronomy	19,100	19,400	(2)	19,200	19,200	(2)	(2)	(2)	(2)
Environmental sciences	19,100	19,300	16,400	19,900	20,300	(2)	(2)	(2)	(2)
Other physical sciences	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical sciences	19,300	20,200	16,900	20,300	20,400	17,400	16,000	16,100	(2)
Mathematics	16,900	18,100	16,200	18,600	19,200	(2)	14,300	14,600	(2)
Computer sciences	24,200	24,200	(2)	24,100	24,100	(2)	(2)	(2)	(2)
Engineering	22,300	22,300	20,300	22,200	22,200	19,800	(2)	(2)	(2)
Life sciences	14,800	14,900	13,300	15,200	15,500	13,300	13,300	13,300	(2)
Biology	14,800	15,000	13,400	15,500	16,200	13,600	12,200	12,200	(2)
Agricultural sciences	14,800	14,800	(2)	14,900	15,000	(2)	14,400	14,400	(2)
Social sciences	16,000	17,200	13,600	16,200	17,000	13,000	15,100	16,500	14,300
Psychology	14,400	15,200	13,500	14,100	15,000	12,600	14,900	16,200	14,400
Economics	18,800	18,900	(2)	19,100	19,100	(2)	(2)	(2)	(2)
Sociology/ anthropology	16,000	18,000	(2)	(2)	(2)	(2)	13,600	(2)	(2)
Other social sciences	17,300	17,500	(2)	(2)	(2)	(2)	17,400	(2)	(2)

[1] Excludes individuals enrolled full time in graduate school.

[2] No median computed for groups with less than 20 respondents.

NOTE: Median salaries computed only for full time employed civilians.

SOURCE: National Science Foundation

other science resources publications

	NSF No.	Price
Science Resources Studies Highlights		
R&D Funds		
"Federal R&D Obligations Will Show Real Growth in 1981—Mostly From DOD Programs"	80-322	
"March Cutback in Federal Budget Leaves Strong Defense R&D Growth in 1981—Other Areas Lag"	80-319	
"Greatest Increase in 1978 Industrial R&D Expenditures Provided by 14% Rise in Companies' Own Funds"	80-300	
S/E Personnel		
"Employment of Scientists and Engineers Increased Between 1976 and 1978 But Declined in Some Science Fields"	80-305	
Detailed Statistical Tables		
R&D Funds		
Academic Science: R&D Funds, Fiscal Year 1979	81-	
Federal Funds for Research and Development, Fiscal Years 1979, 1980, and 1981, Volume XXIX	80-318	
Research and Development in Industry, 1978: Funds, 1978; Scientists and Engineers, January 1979	80-307	
Research and Development in State and Local Governments, Fiscal Year 1977	79-327	
S/E Personnel		
Scientists and Engineers from Abroad, 1976-78	80-324	
Characteristics of Doctoral Scientists and Engineers in the United States, 1979	80-323	
Academic Science: Graduate Enrollment and Support, Fall 1979	80-321	
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Reports		
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Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1978	80-312	$5.50
S/E Personnel		
Employment Attributes of Recent Science and Engineering Graduates	80-325	In press
Scientists, Engineers, and Technicians in Private Industry, 1978-80	80-320	In press
Occupational Mobility of Scientists and Engineers	80-317	$1.75
Composite		
Employment Patterns of Academic Scientists and Engineers, 1973-78	80-314	$1.75
Academic Science, 1972-77: R&D Funds, Scientists and Engineers, and Graduate Enrollment and Support	80-313	$4.25